Winnipeg | Water and Waste
Eaux et déchets

July 22, 2022

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Environment, Climate and Parks
Environmental Stewardship Division
Environmental Compliance and Enforcement
1007 Century Street
Winnipeg, MB R3H 0W4

Attention: James Capotosto, Director

RE: SEWPCC BIOLOGICAL NUTRIENT REMOVAL AND UPGRADE PROJECT – 2022 QUARTER 2 SUMMARY REPORT – APRIL 1 TO JUNE 30, 2022

The City of Winnipeg is submitting the Quarter 2 Summary Report for the South End Water Pollution Control Centre (SEWPCC) Biological Nutrient Removal and Upgrade Project operating under Environmental Act Licence No. 2716RR as required by Manitoba Conservation and Climate Notice of Alteration dated April 14, 2022. This report summarizes the work tasks required to complete the SEWPCC Upgrades required to meet the Environmental Act Licence requirements for the period of April 1 to June 30, 2022.

The following summarizes the works conducted on key areas of the upgrade project.

a) a list of tasks and proposed completion dates such that the construction and commissioning of the upgraded wastewater treatment plant shall be completed as soon as possible and in order to meet the effluent limits as specified in Clause 28 of the License.

Secondary Clarifiers (SC) 1 & 2
Additional rehab has been identified in SC1 which has increased the refurbishment work, with work continuing in SC2. Work involves the concrete refurbishment, installation of new weir baffles, electrical controls, mechanical skimmer and walkway. During spring high level flows, work areas were flooded which has caused some delays. With the increased rehabilitation work, the work is expected to be completed with full handover by Q3 2022. This work is not critical path to the licence conditions.

Grit and Screening Building (Area G), Demonstration Testing
The work in Area G is 97% complete for this period. Grit Tanks 3 & 4 operated during the high flow associated with the spring freshet. HVAC demonstration testing was completed and automation updates were completed. The system is currently in the operating and monitoring stage to confirm performance. A significant number of deficiency items have been remediated. The system has not yet been handed over to the City. Handover is expected in Q3 2022; this is revised from Q1 2022 as final documents, manuals and deficiencies are being completed.

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Secondary Clarifiers 4 & 5, Demonstration Testing
SC 4 and 5 are operating as designed without issue. Handover of SC 4 & 5 to the City has been completed.

High Rate Clarification (HRC) System, Demonstration Testing
The HRC testing and commissioning has been delayed during this period to allow the contractor to focus on Biological Nutrient Removal (BNR) commissioning. The contractor has started testing checks in preparation of wet testing. The planned completion was September 2022. However, deficiencies and leaks within in the channel flowing to the HRC from previous contracts were identified with the increased flows to the area in preparation for testing. These issues have delayed the start of demonstration testing, which is now expected to start in November 2022 with full handover to the City in January 2023. The system will be fully operational prior to the handover with capacity of the plant will increasing from 100 ML/D to 150 ML/D with the commissioning of the BNR expected by end of August 2022. This is a critical path item and these dates will be closely monitored and reported as work progresses.

Chemical Building Testing
Ongoing testing and deficiency clean up of alarms, set points and equipment communication occurred during this period. Work is estimated at 99% complete; operational handover has been revised to Q3 2022 from Q2 2022 based on documentation handover. The system is operational as demonstration testing has been completed as part of the Area R testing of the BNR system. The ferric chloride system is being utilized for phosphorous removal as part of the BNR system.

BNR Demonstration Testing using Chemical Addition for Phosphorus Removal (Licence Conditions)
Startup of the BNR commenced on May 25, 2022 with Tank 1. The commissioning is conducted sequentially one tank at a time, with a total of three tanks. The following summarizes the current status as of this reporting period:

<u>Tank 1</u>
Commissioning commenced on May 25 with “seeding”. This is the process of hauling sludge from the West End Sewage Treatment Plant (WEWPCC) to provide the starter bacteria to Tank 1. On May 30, some primary effluent at SEWPCC was diverted to Tank 1 to start “feeding” the bacteria for nitrification. On June 6, dosing with ferric chloride began to assist with phosphorous removal.

Tank 1 is currently in stable operation and has shown increased biological growth on the IFAS media. Total Phosphorus (TP) concentrations from the BNR process were maintained under 1 mg/L and Total Nitrogen (TN) concentrations below 15 mg/L.

<u>Tank 2</u>
Seeding of Tank 2 commenced on June 20, feeding began June 23, and ferric chloride dosing was started on June 25. With the introduction of bacteria from Tank 1 into Tank 2, biological activities have accelerated.

Tank 3
Tank 3 will start once stable operation in both Tanks 1 & 2 are reached.

Currently approximately 30% of the primary effluent flow has been diverted to the BNR from the high purity oxygen (HPO) system. Commissioning is on track to meet the phosphorous removal with the use of chemical trimming by August 2022.

Raw Sewage Pump #2, Demonstration Testing
The replacement of the raw sewage pump #2 is scheduled for the 2022/2023 low flow period. Currently 10% of the work has been completed and it's on track to be completed in Q1 2023.

HPO Tank Conversion to Fermenters and Biofilter, Demonstration Test
Work on the HPO Tank conversion to fermenters will occur once seeding of the BNR is completed and stable. Over the next reporting period, flows to the BNR will be increased and the HPO will be shut down and repurposed by converting it to fermenters for biological removal of phosphorus. Preparations are being made to start shutting down HPO Tanks 3 and 4 as the BNR is commissioned. Completion date for full biological activity is Q3 2023.

Substantial Performance
The Substantial Performance date has been revised to Q3 2023.

b) Measures the City will take such that the requirements to meet the total phosphorus limit of 1.0 mg/L in effluent can be met as soon as possible without any further delay.

Commissioning of the BNR system commenced on May 25, 2022. The introduction of ferric chloride for chemical trimming started on June 6, 2022 for Tank 1 and June 25, 2022 for Tank 2 commenced on June 25, 2022. Laboratory samples of effluent from the BNR have shown that TP levels are below licence conditions of 1 mg/L and overall plant TP levels decreased from 1.4 mg/L at the start of BNR commissioning to a range of 0.3 to 0.5 mg/L with chemical trimming. Further data will be provided in subsequent reports once it's been compiled.

Area	Contractual Dates	% Previously Reported End of March	% Complete April	% Complete May	% Complete June	Expected Completion	Work Remaining
Secondary Clarifiers 1 & 2	March 20, 2019	50	50	52	55	Q3 2022	Additional remedial works identified for SC 1&2 work to be completed. High flows during spring have delayed some work but completion remains September 2022.
Grit and Screening Building (Area G) Demonstration Testing	August 18, 2019	96	96	97	97	~~Q1 2022~~ Revised Q3 2022	System operating but awaiting handover.
Secondary Clarifiers 4 & 5 Demonstration Testing	July 30, 2019	99	99	99	99	Q1 2022	Secondary clarifiers are fully operational, handed over and meeting performance under City operations. Final close out is tied to the plant completion.
HRC system, Demonstration Testing	April 6, 2020	90	90	92	93	~~Q3 2022~~ Revised to Q1 2023	Additional deficiencies from previous contract has delayed the start of demo testing.
Chemical Building Testing	April 6, 2020	98	98	99	99	Revised Q3 2022~~-2022~~	Contractor has outstanding manuals and reports to submit for handover to the City.
BNR, Demonstration Test using Chemical for Phosphorus Removal	August 10, 2020	97	98	99	99	Q3 2022	Tank 2 has started demonstration testing and is performing well; once it reaches stable performance Tank 3 can be commissioned.
Raw Sewage Pump #2,	March 20, 2021	10	10	10	10	Q1 2023	Contractor has missed low flow period, as a result the works will be completed in Q1 2023 as per NOA submission.

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Demonstration Test							
HPO Tank conversion to Fermenters and Biofilter, Demonstration Testing	July 18, 2021	0	0	5	10	Q3 2023	Once Tanks 1 & 2 are stable, two of the HPO tanks will be shut down.
Substantial Performance	August 29, 2021	71	72	73	74	END Q3 2023	Successful commissioning of BNR, and remedial works in Area C and G nearing commissioning.

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The City continues to utilize the measures within the contract to push the contractor toward project completion in order to meet the licence requirements.

Should you have any questions on the SEWPCC Biological Nutrient Removal and Upgrade Project, please contact Colin Javra at 204-471-1765 or by email at cjavra@winnipeg.ca.

Sin[redacted]

Colin Javra P Eng.
Acting Manager of Enginee ing Services

Attachment

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